

REMARKS

Claims 5-6, 8-10 and 15-17 are pending in this application, of which claim 15 has been amended. Claims 1-4 and 11-14 are canceled and claims 9-10 are withdrawn from consideration. No new claims have been added.

Claims 5, 6, 8 and 15-17 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner has complained about the “undescribed subject matter” in the language of claim 15, “one after another.” Claim 15 has been amended to remove this language.

Thus, the 35 U.S.C. § 112, first paragraph, rejection should be withdrawn.

The Examiner has maintained from the previous Office Action all of the 35 U.S.C. § 103(a) rejections of claims 5-6, 8-10 and 15-17 as unpatentable over various combinations of

APA, Maeda, Koga, Sakata, DiStefano, and Fujimoto et al.

Applicants respectfully traverse these rejections.

The Examiner has asserted:

To further clarify, Sakata teaches that the first pressure is 20 kg/cm² and the second pressure is about 20 kg/cm², and the range encompassed by the phrase “about 20 kg/cm²” encompasses a pressure greater than the first pressure of 20 kg/cm².

Applicants respectfully disagree. As noted in the response filed March 6, 2006:

Applicants submit that no experimental results showing any advantages or unexpected results tending to establish the criticality of the claimed range need be submitted because the claimed feature is logically clear without the necessity of experimental results. This is because, as described previously and also described in the originally filed specification, if the first pressure were greater than the

second pressure applied to the semiconductor chips, the bumps would be deformed to such a great extent that no further substantial deformation could be achieved by the relatively small second pressure, and, thus, final alignment of the heights thereof could not be achieved.

On the other hand, according to the present invention, when the second pressure is greater than the first pressure, it is possible to finally align the heights of the semiconductor bumps as it is possible to substantially further deform the semiconductor bumps with the second pressure after the same bumps are deformed by the relatively small first pressure. This is because, even after the bumps are deformed by the first pressure, the same bumps can be substantially further deformed by a second pressure which is greater than the first pressure.

Sakata discloses that each of the first pressure and a second pressure is approximately 20 kg. It is therefore clear that Sakata teaches that the first and second pressures are substantially *the same*. Accordingly, it is respectfully submitted that Sakata fails to teach that the second pressure is greater than the first pressure, as claimed in the present invention.

Furthermore, because each semiconductor chip is pressed separately in the first fixing, it is possible to position the semiconductor chips with high precision and it is also possible to reduce the time required for curing the resin because the pressing in the aggregate for the plurality of semiconductor chips is carried out in the second fixing.

High precision pressing control is required for achieving the positioning with high precision in the first fixing. For this purpose, the machine required for this is large and complicated. Accordingly, it is difficult to carry out high precision positioning of the plurality of semiconductor chips in the aggregate.

Therefore, by separating into the first fixing of mounting the semiconductor chip separately with high precision and the second fixing of curing the resin in the aggregate for the plurality of semiconductor chips, the high precision pressing mechanism is not required in the

second fixing because the positioning of the semiconductor chips has already been finished in the first fixing. As a result, for the second fixing, merely a simple pressing mechanism does well, and the plurality of semiconductor chips may be pressed in the aggregate with a high density.

Further, because a two-stage bump shape is applied, the bump height depends very much from the application pressure because the bump projecting end is thin in the first fixing. Therefore, in the first fixing, the bump collapse amount is controlled with high prevision pressing control and high parallelism. Then, in the second fixing, the pressing control can be made roughly. That is, in the second fixing, because the bottom portion of the bump is pressed, the bump height is less dependent on the application pressure.

Accordingly, claim 15 has been amended to clarify this distinction, and the amended language is supported on page 10, lines 4-13 of the specification of the instant application.

Thus, the 35 U.S.C. § 103(a) rejections should be withdrawn.

In view of the aforementioned amendments and accompanying remarks, claims 5-6, 8 and 15-17, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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